

ROBERT J. BUDNITZ

Occupation: Physicist in Energy/Environmental Research and Nuclear Safety

Birth: October 12, 1940 in Pittsfield, Massachusetts

Education: Yale University, New Haven, Connecticut
B.A. Physics (1961)
Harvard University, Cambridge, Massachusetts
M.A. Physics (1962)
Ph.D. Physics (1968)

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Present Professional Position (since September 2007):

Lawrence Berkeley National Laboratory, University of California, Berkeley, California
Staff Scientist, Earth Sciences Division

Past Professional Positions

Lawrence Livermore National Laboratory, University of California, Livermore, California

December 2004 to September 2007 (in Livermore):

Leader, Nuclear & Risk Science Group, Energy & Environment Directorate
Associate Program Leader for Nuclear Systems Safety and Security, E&E Directorate

October 2002 to November 2004 (at the US Department of Energy, in Washington DC):

Responsible for the Science & Technology Program, DOE Yucca Mountain Project

Future Resources Associates, Inc., Berkeley, California
1981 - 2002 President

Teknekron, Inc., Berkeley, California
1980 - 1981 Vice President, and Director of the Energy and
Environmental Technologies Division

U.S. Nuclear Regulatory Commission, Washington, D.C.
1979 - 1980 Director, Office of Nuclear Regulatory Research
1978 - 1979 Deputy Director, Office of Nuclear Regulatory Research

Lawrence Berkeley Laboratory, University of California, Berkeley, California
1978 - 1980 Leave of Absence Status
1975 - 1978 Associate Director of LBL, and Head, Energy & Environment Division
1974 - 1975 Program Leader, LBL Environmental Research Program
1971 - 1974 Physicist, LBL Environmental Research Program
1967 - 1971 Post-Doctoral Physicist, LBL High-Energy Physics Program

Honors and Awards

American Association for the Advancement of Science (elected Fellow, 2007)

American Nuclear Society, Standards Service Award (2006)

American Nuclear Society, Theos J. Thompson Award for Reactor Safety (2005)

U.S. National Academy of Sciences, National Associate (selected 2002)

Society for Risk Analysis, "Outstanding Risk Practitioner Award for 2001"

American Nuclear Society (elected Fellow, 1998)

Society for Risk Analysis (elected Fellow, 1996)

American Physical Society (elected Fellow, 1988)

American Nuclear Society, Nuclear Reactor Safety Division, "Best Paper Award" (1988)

National Science Foundation Graduate Fellowship in Physics (1961 - 1963)

Phi Beta Kappa, Yale University (1961)

Sigma Xi, Yale University (1961)

Student Marshall, Yale Baccalaureate Procession (1961)

Varsity Letter, Track Team, Yale University (1961):

**track team won national indoor championship,
Intercollegiate Amateur Athletic Association of America**

Memberships

American Nuclear Society (fellow)

American Physical Society (fellow)

American Association for the Advancement of Science (fellow)

Society for Risk Analysis (fellow)

Government Employment Status

Senior Executive Service, Charter Member (1979)

(inactive since leaving the US NRC in 1980)

Professional Activities (Current)

Co-chair, ANS-ASME JCNRM (Joint Committee on Nuclear Risk Management), under the American Nuclear Society and the American Society of Mechanical Engineers (2012 - present)

Member (since October 2007), Chairman (2009-2010), State of California's Diablo Canyon Independent Safety Committee, appointed by the California Attorney General (2007 - present)

Member, Technical Review Committee, Japan Nuclear Safety Institute (2012 – present)

Member, Standards Board, American Nuclear Society (2009 - present)

Member, Editorial Board, ASCE-ASME “Journal of Risk and Uncertainty in Engineered Systems” (2013 – present)

Vice-Chair, ANS 54.1 Working Group writing a new ANS standard 54.1, “Nuclear Safety Criteria and Design Process for Liquid-Sodium-Cooled-Reactor Nuclear Power Plants,” American Nuclear Society (2010 - present)

Member, Editorial Board, Risk Analysis Journal (2008 –present)

Member, Nuclear Risk Management Coordinating Committee, organized by ANS (American Nuclear Society) and ASME (American Society of Mechanical Engineers) (2003 - present)

Member, Program Committee, American Nuclear Society's Nuclear Installations Safety Division (1999 - present)

Member (since 1998), Chairman (1998 - 2003), Writing Group on the External-Hazards-PRA-Methodology Standard, Risk Informed Standards Consensus Committee, American Nuclear Society; now “Working Group 5” under the ASME-ANS Joint Committee on Nuclear Risk Management (1998 - present)

Member (since 1998), Chairman (1998 – 2002), Writing Group on the Low-Power-and-Shutdown-PRA-Methodology Standard, Risk Informed Standards Consensus Committee, American Nuclear Society; now the “LPSP Writing Group” under the ASME-ANS Joint Committee on Nuclear Risk Management (1998 - present)

U.S. Representative, President of Armenia's Nuclear Energy Safety Council (1996 - present)

Other Professional Activities (Past)

Consultant, Nucleoelectrica-Argentina S.A. (NA-SA), for the peer review of the Seismic Safety Evaluation Programme of the Atucha-II Nuclear Power Plant (2011 - 2013)

Member, Steering Committee, SMiRT 22, “22nd International Conference on Structural Mechanics in Reactor Technology,” in San Francisco in August 2013 (2011 - 2013)

Chair (2009-2012), Vice Chair (2007-2009), Member (1998-2007), Risk Informed Standards Consensus Committee, American Nuclear Society (1998 - 2012)

Member, Committee on Nuclear Risk Management, Board on Nuclear Codes and Standards, American Society of Mechanical Engineers (1998 - 2012)

Member, U.S. Secretary of Energy's Science Panel for the Fukushima Accident (2011)

Lecturer, World Nuclear University: Idaho Falls (2005), Ottawa (2008), Oxford (2009, 2010)

Member, Liquid Metal Reactor Accident Sequence Delineation Gap Analysis Panel, Sandia National Laboratories (2009 – 2010)

Member, Executive Committee (**elected**), American Nuclear Society's Nuclear Installations Safety Division (2007 – 2010)

Member, Organizing Committee, OECD Nuclear Energy Agency “Workshop on Recent Findings and Developments in Probabilistic Seismic Hazard Analysis Methodologies”, OECD Nuclear Energy Agency, Lyon, France (2008)

U.S. Representative, Nuclear Safety Advisory Committee of Lithuania, reporting to the Prime Minister of Lithuania (1997 - 2008)

Member, National Research Council/National Academy of Sciences, Committee on the Internationalization of the Nuclear Fuel Cycle (2006 - 2008)

Member, Nuclear Energy Study Group of the American Physical Society's Panel on Public Affairs (2004 - 2008)

Member, Peer Review Panel, Probabilistic Volcanic Hazard Assessment Update (PVHA-U) Analysis Project, Yucca Mountain Project, US Department of Energy (2005-2007)

Peer Reviewer, "Facility Risk Review of the 9212 Complex at Y-12", Oak Ridge Operations Office, US Department of Energy (2006)

Member, Organizing Committee, OECD Nuclear Energy Agency “Specialists Meeting on Seismic Probabilistic Safety Assessment of Nuclear Facilities,” OECD Nuclear Energy Agency, Jeju, Korea (2006)

Member, Evaluation Panel for IAEA Major Programme 3, International Atomic Energy Agency (2006)

Member, Editorial Board, Journal of Reliability Engineering and System Safety (1999 - 2004)

Member, Regulatory Working Group under the US-Russian Joint Steering Committee on Scientific and Technical Cooperation in the Management of Plutonium (2000 - 2004)

Member, Scientific and Technical Advisory Committee to the University of Chicago, overseeing Argonne National Laboratory (1997 - 2003)

Member, National Research Council/National Academy of Sciences, Board on Radioactive Waste Management (1998 - 2002)

Member, Board of Directors, California Radioactive Materials Management Forum (1988 - 2002)

Member, Independent Review Committee for the Research Reactors Division, Oak Ridge National Laboratory (1987 - 2002)

Chairman, Yucca Mountain Project, Peer Review Panel for Igneous Consequences, Bechtel SAIC Company (2002)

Member, National Research Council/National Academy of Sciences, Panel on Nuclear and Radiological Issues under the Committee on Science & Technology for Countering Terrorism (2002)

Chairman, Specialist Meeting on Dynamic Impact and Fire Modeling in Nuclear Installations, OECD Nuclear Energy Agency, Paris (2002)

Member, Quantitative Risk Assessment Expert Panel for Anniston, Umatilla, and Pine Bluff, U.S. Army Program Manager for Chemical Demilitarization (1999 - 2002)

Member, Yucca Mountain Project, Postclosure Strategy Panel, Bechtel SAIC Company (2001 - 2002)

Technical Integrator, Expert Panel on Fire-Induced Inadvertent Actuation, Electric Power Research Institute (2001 - 2002)

Member, National Research Council/National Academy of Sciences, Committee on Alternatives for the Control of Solid Materials from NRC-Licensed Facilities (2000 - 2002)

Member, Project Team on Risk Management for Nuclear Facility Applications, Board on Nuclear Codes and Standards, American Society of Mechanical Engineers (1998 - 2001)

Invited Expert, ARPANSA Public Forum on the Construction License Application for a Replacement Research Reactor, sponsored by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), Sydney (2001)

Member, Secretary of Energy's Panel on Emerging Technological Alternatives to Incineration, under the DOE Secretary of Energy Advisory Board (2000 - 2001)

Member, Expert Panel on the Role and Direction of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission (2000 - 2001)

Member, Performance Assessment Peer Review Panel, DOE Yucca Mountain Project Office (1997 - 1999)

Rapporteur, Group of Senior Experts to Review the Russian Nuclear Power Plant Safety Research Strategic Plan, OECD Nuclear Energy Agency (1998 - 1999)

Member, Executive Committee, Nuclear Installations Safety Division, American Nuclear Society (1996 - 1999) **Chairman** (elected), 1997-98]

Member, Senior Technical Review Panel, Continued Storage Analysis Project, Yucca Mountain Project (1998 - 1999)

Member, Special Committee on Social Issues and Human Values [formerly Special Committee on Socio-Technological Issues], American Nuclear Society (1988 - 1998)

Member, Organizing Committee, OECD Nuclear Energy Agency "Tokyo Workshop on Seismic Risk", OECD Nuclear Energy Agency (1999)

U.S. Representative, Ignalina Safety Panel to Advise the European Bank for Reconstruction and Development on the Ignalina (Lithuania) Nuclear-Power-Plant Safety Analysis Report (1994 - 1998)

Chairman, Technical Review Team for DOE Natural Phenomena Hazards Existing Facilities Project, U.S. Department of Energy (1992 - 1998)

Consultant, to Division of Nuclear Safety, International Atomic Energy Agency, Vienna, on subject of Seismic and Fire PRA (1992 - 1997)

Chairman, National Research Council/National Academy of Sciences, Committee on Remediation of Buried and Tank Wastes, under the Board on Radioactive Waste Management (1992 - 1996)

Member, Government of Austria, International Expert Team to Review Mochovce Nuclear Power Plant Safety (1998)

Member, Board of Directors, Pacific Environment and Resources Center [formerly Golden Gate Energy Center], Ft. Cronkhite, California (1985 - 1998)

Member, Visiting Committee for the Department of Advanced Technology, Brookhaven National Laboratory (1996 - 1997)

Member, U.S. Environmental Protection Agency, National Advisory Council on Environmental Policy and Technology, Advisory Committee on WIPP, the Waste Isolation Pilot Plant (1993 - 1998)

Chairman (1991 and 1995) and **Member** (1988 - 1997), University of Chicago Review Committee for the Engineering Development Division [formerly Engineering Physics Division], Argonne National Laboratory (1988 - 1997)

U.S. Representative, Safety Review Group for the Nuclear Safety Account for Upgrading Soviet-Designed Reactors, European Bank for Reconstruction and Development (1993 - 1997)

Chairman, Oversight Panel, Yucca Mountain Seismic Hazards Evaluation, U.S. Department of Energy (1995 - 1996)

Member, Expert Panel on Risk Assessment, U.S. Army Chemical Demilitarization and Remediation Activity, Edgewood Arsenal, Maryland (1994 - 1997)

Member, Performance Assessment Peer Review Panel, DOE Waste Isolation Pilot Plant, Sandia National Laboratories (1987 - 1996)

Member, Expert Panel on Aircraft Crash Risk Analysis Methodology, U.S. Department of Energy (1994 - 1996)

Chairman, Senior Seismic Advisory Panel for the Savannah River Site, Westinghouse Savannah River Company (1994 - 1995)

Chairman, Senior Seismic Hazard Analysis Committee, co-sponsored by U.S. Department of Energy, U.S. Nuclear Regulatory Commission, and Electric Power Research Institute (1993 - 1996)

Member, National Research Council/National Academy of Sciences, Panel on Options for Disposition of Weapons-Related Plutonium, under Committee on International Security and Arms Control (1992 - 1995)

Member, National Research Council/National Academy of Sciences, Committee on Technical Bases for Yucca Mountain Standards (1993 - 1995)

Member, Review Team for the U.S. Department of Energy's Natural-Phenomena-Hazards-Mitigation Order and Standards (1994 - 1995)

Chairman, Peer Review Panel for the Rocky Flats Site Seismic Hazard Assessment (1994)

Member, Advisory Group on Treatment of Hazards in Probabilistic Safety Assessment, International Atomic Energy Agency, Vienna (1986 - 1992)

U.S. Coordinator, Case Studies Preparation Task for "Manual for Probabilistic Safety Assessment and Its Application in Safety Decisions", International Atomic Energy Agency, Vienna (1984 - 1992)

Member, Board of Directors, Energy and Technology Management Corporation (a spin-off of Science Applications International Corporation) (1992 - 1993)

Chairman, Seismic Consolidated Peer Review Group, Savannah River Site, U.S. Department of Energy (1990)

Chairman, Senior External Events Review Group, Office of New Production Reactor, U.S. Department of Energy (1989 - 1992)

Member, High-Level Review Committee, Savannah River Site Probabilistic Risk Assessment, U.S. Department of Energy (1989 - 1990)

Member, Peer Review Group for the Hope Creek Risk Assessment, Public Service Electric and Gas Company (1989 - 1990)

Member, Severe Accident Advisory Committee, Savannah River Laboratory (1988 - 1992)

Principal Speaker, Commonwealth Club of California, Weekly Nationally Broadcast Address (1989)

Chairman, External Review Board for ATR (Advanced Test Reactor) Safety Analysis Program, Idaho National Engineering Laboratory/EG&G-Idaho (1989)

Member, N Reactor PRA Independent Review Board, Westinghouse Hanford Company (1988 - 1990)

Member, Executive Committee, Northern California Section, American Nuclear Society (1988 - 1989)

Member, Review Group on Nuclear Reactor Research Integration, Idaho National Engineering Laboratory/EG&G-Idaho (1987 - 1989)

Chairman, Advanced Reactor Peer Review Group, U.S. Nuclear Regulatory Commission (1987 - 1988)

Member, Advisory Panel on Seismic Component Fragilities, Brookhaven National Laboratory (1986 - 1990)

Chairman, Expert Panel on Seismic Design Margins, U.S. Nuclear Regulatory Commission (1984 - 1987)

Chairman, Peer Review Expert Panel on Plant Aging, Battelle Pacific Northwest Laboratory for U.S. Nuclear Regulatory Commission (1987)

Member, New Production Reactor Panel of the DOE Energy Research Advisory Board, U.S. Department of Energy (1988)

Member, Expert Panel on Front-End Issues, NUREG-1150 Analysis Team, Sandia National Laboratories for U.S. Nuclear Regulatory Commission (1987 - 1988)

Member, U.S. Army Chemical Munitions Disposal Risk Assessment Review Panel, GA Technologies, Inc. (1987)

Member, Panel on Energetic Events, Review Group on Uncertainties in Source Term Estimates from Severe Accidents in Nuclear Power Plants, U.S. Nuclear Regulatory Commission (1987)

Chairman, Panel to Review EPRI's Seismic Margin Methodology, U.S. Nuclear Regulatory Commission (1987)

Chairman, Peer Review Group, Maine Yankee Seismic Margin Study, U.S. Nuclear Regulatory Commission (1986 - 1987)

Chairman, Seabrook Emergency Planning Zone Study Peer Review Group, New Hampshire Yankee Division, Public Service Company of New Hampshire (1985 - 86)

Member, Chernobyl Advisory Panel, Electric Power Research Institute (1986 - 1987)

Member, Improved Confinement Review Panel, Savannah River Laboratory, E.I. DuPont de Nemours, Inc. (1986 - 1987)

Member, Board of Directors, Northern California Chapter, Society of Risk Analysis (1986 - 1987)

Member, Senior Committee on Environmental, Safety, and Economic Aspects of Fusion Energy, U.S. Department of Energy (1985 - 1987)

Liaison from Energy Engineering Board to Committee on Nuclear Safety Research, National Research Council/National Academy of Sciences (1985 - 1986)

Member, Exploratory Committee on the Future of Nuclear Power Generation, National Research Council/National Academy of Sciences (1984)

Organizer, First Seminar on Excellence in Energy Management, Association of Professional Energy Managers, San Francisco (1984)

Consultant on Comparative Risks in the Nuclear Fuel Cycle, to the Nuclear Energy Agency of the Organization for Economic Cooperation and Development, Paris (1984)

Member, Independent Review Panel for Environmental Assessments, Roy F. Weston Inc., for the Office of Civilian Radioactive Waste Management, U.S. Department of Energy (1984)

Member, National Research Council/National Academy of Sciences, Energy Engineering Board (1983 - 1986)

Chairman, Peer Review Group, DOE Office of Crystalline Repository Development, Battelle Project Management Division (1983 - 1986)

Consultant, Study Group on Radionuclide Releases from Severe Nuclear Power Plant Accidents, American Physical Society (1983 - 1985)

Member, U.S. Environmental Protection Agency Science Advisory Board, Subcommittee on High-Level Radioactive Waste Disposal (1983 - 1984)

Member and **OECD/NEA Liaison Representative**, Programme Group, Second Specialist Meeting on Probabilistic Methods in Seismic Risk Assessment for Nuclear Power Plants, OECD Nuclear Energy Agency, at Lawrence Livermore National Laboratory (1983)

Member, Three Mile Island Mass Balance Project Review Committee, NUS Corporation, for U.S. Department of Energy (1982 - 1983)

Invited Participant, Workshop on Technological and Regulatory Changes in Nuclear Power, U.S. Congress Office of Technology Assessment (1982)

Member, Advisory Committee to Review the Agency's Nuclear Safety Activities, International Atomic Energy Agency, Vienna (1982)

Member, Peer Review Committee to Review the International Atomic Energy Agency's Transportation Dose Model INTERTRAN, sponsored by U.S. Department of Energy (1981 - 1982)

Technical Coordinator, Special Inquiry Group into the Three Mile Island Accident (the "Rogovin Inquiry"), U.S. Nuclear Regulatory Commission (1979 - 1980)

U.S. Representative, Committee on the Safety of Nuclear Installations, Nuclear Energy Agency of the Organization for Economic Cooperation and Development, Paris (1979 - 1980)

Member, Panel on Public Affairs, American Physical Society (1978 - 1981)

Speaker, ENERGY-2020 Lecture Series, sponsored by National Science Foundation (1978)

Member, Editorial Advisory Group, "Electric Power Systems Research", journal published by Elsevier (1977 - 1985)

Member, Risk Assessment Review Group (the "Lewis Committee"), U.S. Nuclear Regulatory Commission (1977 - 1979)

Editor-in-Chief, "CRC Forums on Energy", CRC Press, West Palm Beach, Florida (1976 - 1980)

Member, National Research Council/National Academy of Sciences, Panel on Sources and Control Techniques, Environmental Research Assessment Committee (1975 - 1977)

Co-organizer (with T.H. Pigford), University of California Extension Courses on "Environmental Impacts of Electricity Generation", week-long course given in 1974, 1975, 1976, 1977

Member, Reactor Hazards Committee, Berkeley Research Reactor, University of California, Berkeley (1974 - 1978)

Member, Subpanel on Energy, U.S. Atomic Energy Commission High Energy Physics Advisory Panel (1974)

Member, Reactor Safety Study Group, American Physical Society (1974 - 1975)

Publications

"Unsuccessful Search for an Excited Electron", R.J. Budnitz, J.R. Dunning, M. Goitein, N.F. Ramsey, J.K. Walker, and Richard Wilson, *Physical Review* 141, 1313 (1966)

"Measurements of Elastic Electron-Proton Scattering at High Momentum Transfers by a Coincidence Technique", M. Goitein, R.J. Budnitz, L. Carroll, J. Chen, J.R. Dunning, K. Hanson, D. Imrie, C. Mistretta, J.K. Walker, Richard Wilson, G.F. Dell, M. Fotino, J.M. Patterson, and H. Winick, *Physical Review Letters* 18, 1016 (1967)

"Quasi-Elastic Electron-Deuteron Scattering at Forward Angles", R.J. Budnitz, J. Appel, L. Carroll, J. Chen, J.R. Dunning, M. Goitein, K. Hanson, D. Imrie, C. Mistretta, J.K. Walker, and Richard Wilson, *Physical Review Letters* 19, 809 (1967)

"Neutron Form Factors from Quasi-Elastic Electron-Deuteron Scattering", R.J. Budnitz, J. Appel, L. Carroll, J. Chen, J.R. Dunning, M. Goitein, K. Hanson, D. Imrie, C. Mistretta, J.K. Walker, and Richard Wilson, *Physical Review* 173, 1357 (1968)

"Search for the Electroproduction of the $N'(1470)$ Resonance from Deuterium", J. Alberi, J. Appel, R.J. Budnitz, J. Chen, J.R. Dunning, M. Goitein, K. Hanson, D. Imrie, C. Mistretta, and Richard Wilson, *Physical Review* 176, 1631 (1968)

"Differential Cross-Sections for Neutral-Pion Electroproduction Near the First Pion-Nucleon Resonance", C. Mistretta, D. Imrie, J. Appel, R.J. Budnitz, L. Carroll, J. Chen, J.R. Dunning, M. Goitein, K. Hanson, A. Litke, and Richard Wilson, *Physical Review Letters* 20, 1070 (1968)

"Angular Distributions for Pi-Plus Electroproduction and the Pion Form Factor", C. Mistretta, D. Imrie, J. Appel, R.J. Budnitz, L. Carroll, M. Goitein, K. Hanson, and Richard Wilson, *Physical Review Letters* 20, 1523 (1968)

"Coincidence Measurements of Single-Pion Electroproduction Near the Delta(1236) Resonance", C. Mistretta, J. Appel, R.J. Budnitz, L. Carroll, J. Chen, J.R. Dunning, M. Goitein, K. Hanson, D. Imrie, and Richard Wilson, *Physical Review D*, 184, 1487 (1969)

"Elastic Electron-Proton Scattering Cross-Sections Measured by a Coincidence Technique", M. Goitein, R.J. Budnitz, L. Carroll, J. Chen, J.R. Dunning, K. Hanson, D. Imrie, C. Mistretta, and Richard Wilson, *Physical Review D* 1, 2449 (1970)

Survey of Instrumentation for Environmental Monitoring, Report LBL-1, Environmental Instrumentation Group, Lawrence Berkeley Laboratory (1972)

"A Charge Asymmetry Measurement System", R.M. Graven, J.H. Brewer, R.J. Budnitz, R.L. McCarthy, and D.H. Miller, *Nuclear Instruments and Methods* 102, 45 (1972)

"CP-Violating Charge Asymmetry in the Decay $K_L^0 \rightarrow \pi + \mu + \text{neutrino}$ ", R.L. McCarthy, J.H. Brewer, R.J. Budnitz, A.C. Entis, R.M. Graven, D.H. Miller, and W.N. Ross, *Physics Letters* 42B, 291 (1972)

"Charge Asymmetry in the Decay $K_L^0 \rightarrow \pi + \mu + \text{neutrino}$ ", R.L. McCarthy, J.H. Brewer, R.J. Budnitz, A.C. Entis, R.M. Graven, D.H. Miller, and W.N. Ross, *Physical Review D* 7, 687 (1973)

"Radon-222 and Its Daughters - A Review of Instrumentation for Occupational and Environmental Monitoring", R.J. Budnitz, *Health Physics* 26, 145 (1974)

"Tritium Instrumentation for Environmental and Occupational Monitoring - A Review", R.J. Budnitz, *Health Physics* 26, 165 (1974)

"Plutonium: A Review of Measurement Techniques for Environmental Monitoring", R.J. Budnitz, *IEEE Transactions on Nuclear Science*, NS-21(1), 430 (1974)

"Krypton-85: A Review of Instrumentation for Environmental Monitoring", R.J. Budnitz, in Noble Gases, R.E. Stanley and A.A. Moghissi (editors), U.S. Environmental Protection Agency, Las Vegas, Nevada (1975)

"Instrumentation for Environmental Monitoring in Biological Systems", N.A. Amer, R.M. Graven, R.J. Budnitz, and D.A. Mack, *IEEE Transactions on Nuclear Science*, NS-22(1), 633 (1975)

Report to the American Physical Society by the Study Group on Light-Water Reactor Safety, H.W. Lewis, R.J. Budnitz, A.W. Castleman, D.E. Dorfman, F.C. Finlayson, R.L. Garwin, L.C. Hebel, S.M. Keeny, R.A. Muller, T.B. Taylor, G.F. Smoot, and F. von Hippel, *Reviews of Modern Physics* 47, Supplement No. 1 (1975)

"Review of the American Physical Society Light Water Reactor Safety Study", R.J. Budnitz, *IEEE Transactions on Nuclear Science* NS-23(1), 25 (1976)

"Social and Environmental Costs of Energy Systems", R.J. Budnitz and J.P. Holdren, in Annual Review of Energy, J.M. Hollander (editor), Vol. 1, 553 (1976)

"Sources of Residuals and Techniques for Their Control: Research and Development Needs", Panel on Sources and Control Techniques, Environmental Research Assessment Committee (R. J. Budnitz, member), National Research Council/National Academy of Sciences (1977)

"U.S. Electricity Through the Year 2000: Coal or Nuclear?", R. J. Budnitz, L. D. Hamilton, J. P. Holdren, and J.D. Morgan, *CRC Forum on Energy*, CRC Press (1977)

"U.S. Energy Through the Year 2000: How Much Will Be Required?", K.C. Hoffman, R.J. Budnitz, J.H. Gibbons, P.F. Swenson, and D. Wood, *CRC Forum on Energy*, CRC Press (1977)

"Risk Assessment Review Group Report to the U.S. Nuclear Regulatory Commission," H.W. Lewis, R.J. Budnitz, H.J.C. Kouts, W.B. Loewenstein, W.D. Rowe, F. von Hippel, and F. Zachariasen, Report NUREG/CR-0400, U.S. Nuclear Regulatory Commission (1978)

"Human Disease from Radon Exposures: The Impact of Energy Conservation in Residential Buildings", R.J. Budnitz, J.V. Berk, C.D. Hollowell, W.W. Nazaroff, A.V. Nero, and A.H. Rosenfeld, *Energy and Buildings* 2, 209 (1979)

"Highlights of the NRC Licensing Process and the NRC R&D Program for Deep Geological Storage Facilities", R.J. Budnitz, *IEEE Transactions on Nuclear Science*, NS-27(4), 1268 (1980)

Three Mile Island: A Report to the NRC and to the Public, U.S. Nuclear Regulatory Commission Special Inquiry Group, in four volumes: Mitchell Rogovin, Director (R.J. Budnitz, Technical Coordinator), U.S. Nuclear Regulatory Commission (1980)

"How Reactor Safety is Assured in the United States", article in Energy for the Year 2000, Richard Wilson (editor), Plenum Press, New York (1981)

"The Role of Risk Assessment in Reactor Safety", article in Energy for the Year 2000, Richard Wilson (editor), Plenum Press, New York (1981)

"The Response of the Nuclear Regulatory Commission to the Accident at Three Mile Island", article in The Three Mile Island Accident: Lessons and Implications, T.H. Moss and D.L. Sills (editors), Annals of the New York Academy of Sciences, Vol. 365, pp. 203-209 (1981)

"Review and Critique of Previous Probabilistic Accident Assessments for the Shoreham Nuclear Power Station", R.J. Budnitz, P.R. Davis, S. Fabric, and H.E. Lambert, Future Resources Associates, Inc., Report prepared for Suffolk County (New York) Radiological Emergency Response Plan Steering Committee (1982)

"Future Directions for Seismic Risk Research", R.J. Budnitz, Proceedings of Seismic Risk and Heavy Industrial Facilities Conference, San Francisco, sponsored by Lawrence Livermore National Laboratory (1983)

"Reactor Quality, Factors Affecting Managerial and Institutional Competence of Utility Nuclear Operations", A. Weitzberg, P.D. O'Reilly, J. Snell, M.R. Booska, A.C. D'Hoostelaere, F.C. Duvall, and R.J. Budnitz, Report NUS-4314, prepared by NUS Corporation for U.S. Congress Office of Technology Assessment (1983)

Instrumentation for Environmental Monitoring of Radiation, R.J. Budnitz, A.V. Nero, D.J. Murphy, and R.M. Graven, John Wiley & Sons, New York (1983)

"What We Now Know (And Don't Know) About Reactor Safety", R.J. Budnitz, Workshop on Nuclear Electric Power in the Asia-Pacific Region, Honolulu East-West Center (1983), published in Energy, Vol. 9, 943 (1984)

"External Initiators in Probabilistic Reactor Safety Analysis -- Earthquakes, Fires, Floods, Winds", Risk Analysis 4, 323 (1984)

"Report on the Review of Proposed Environmental Standards for the Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes (40 CFR 191)", H.E. Collier, B.B. Boecker, R.J. Budnitz, F. Culler, S.N. Davis, C. Fairhurst, B. Giletti, S.V. Kaye, K. Krauskopf, T.R. Lash, J.V. Neel, D. Okrent, and F. Parker, High-Level Radioactive Waste Disposal Subcommittee of the Science Advisory Board, U.S. Environmental Protection Agency (1984)

"Uncertainties in the Systems Analysis Part of Seismic Probabilistic Risk Assessment, Phase I Final Report", R.J. Budnitz and H.E. Lambert, report by Future Resources Associates to U.S. Nuclear Regulatory Commission (1984)

"NRC Seismic Design Margins Program Plan", G.E. Cummings, J.J. Johnson, and R.J. Budnitz, Report UCID-20247, Lawrence Livermore National Laboratory (1984); also published in "Transactions of the 8th International Conference on Structure Mechanics in Reactor Technology, Brussels", Report NUREG/CP-0065, U.S. Nuclear Regulatory Commission (1985)

"Probabilistic Risk Assessment Reference Document", J. A. Murphy, D. C. Aldrich, A.S. Benjamin, R.J. Budnitz, J.W. Hickman, V. Joksimovich, W.E. Vesely, and J. Young, Report NUREG-1050, U.S. Nuclear Regulatory Commission (1984)

"An Approach to the Quantification of Seismic Margins in Nuclear Power Plants", R.J. Budnitz, P.J. Amico, C.A. Cornell, W.J. Hall, R.P. Kennedy, J.W. Reed, and M. Shinozuka, Lawrence Livermore National Laboratory, Report NUREG/CR-4334, prepared for U.S. Nuclear Regulatory Commission (1985)

"The Implications of Reduced Source Terms for U.S. Nuclear Regulation and For Existing and New Reactor Designs", R.J. Budnitz, paper at 5th Pacific Basin Nuclear Conference, Seoul (1985)

"Winning Power Generation Technologies for the Future", P.B. Bos, J. M. Weingart, R.J. Budnitz, and J. Doyle, Polydyne, Inc., San Mateo, California, report prepared for Southern California Edison Company (1985)

"An Appropriate Level for Reactor Safety Research", R.J. Budnitz and H.J.C. Kouts, Proceedings of International ANS/ENS Topical Meeting on Thermal Reactor Safety, San Diego, Vol. 5, page XXIV.5-1 (1986)

"Utility Benefits From Targeting Demand-Side Management Programs at Specific Distribution Areas", B. Rosenblum, P. Donovan, H. Hamester, C. LaPorta, J. Taul, J. Eto, E. Kahn, and R.J. Budnitz, Report EPRI EM-4771, report prepared by R&C Enterprises, Ltd., Santa Cruz, California for Electric Power Research Institute (1986)

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